In re Patent Application of:
ENRIQUEZ ET AL
Serial No. **10/090,291**
Filed: **03/04/2002**

REMARKS

Claims 15-20, which were pending as of the Final Office Action of October 19, 2005, have been cancelled, and Claims 21-32 have been added. Consequently, Claims 21-32 are currently pending. Reconsideration of this application in light of the foregoing amendments and following remarks is respectfully requested.

The outstanding Final rejection of Claims 15-20, under the provisions of 35 U.S.C. 103, as being unpatentable over the references to Takato et al and McAndrews, particularly as applied to replacement Claims 21-32, is respectfully traversed, and applicants urge reconsideration and favorable action on replacement Claims 21-32, in light of the language of such replacement claims, and the discussion to follow.

Of replacement Claims 21-32, Claims 21, 25 and 29 are independent, with Claims 22-24 being dependent upon Claim 21, Claims 26-28 being dependent upon Claim 25, and Claims 30-32 being dependent upon Claim 29.

In defining the invention in the replacement claims, applicants have endeavored to particularly point out and distinctly claim both the architecture and functionality of the circuit of the present invention, through which a DC voltage is applied to tip and ring amplifiers of a subscriber line interface circuit. In particular, the replacement claims more particularly define the connectivity of the voltage regulator to the voltage-dividing node of the volts divider through which current flows as a result of the application of an input voltage (Vbat) to the circuit. Current flow through the voltage divider determines the current that is supplied by respective current sources to the tip and ring amplifiers, such as the currents generated by the

current sources 41T and 41R in the architecture shown in Figure 4, for example.

In the final rejection of October 19, 2005, the patent to Takato et al, 4,935,960, was cited for the battery feed circuit depicted in Figure 38A. Figure 38A of Takato et al shows the details of an implementation of the basic battery feed circuit shown in Figure 2. As illustrated therein, the battery feed circuit for the tip and ring paths serves to maintain the voltage at terminal B2 equal to the voltage at terminal B1. Letting the voltage at terminal B2 represent TRIP and the voltage at terminal B2 represent RING, then the circuit of Takato et al operates to maintain the TRIP-to-ground voltage equal to the RING-to-battery voltage, where the battery voltage is the voltage V_{BB}. The terminals B2 and B1 are shown at the central portion of the circuit architecture of Figure 38A, which includes an upper portion 1-B and a lower portion 1-A.

Applicants' invention, on the other hand, maintains the TIP/RING voltage relative to ground that is applied to each of the tip and ring amplifiers, in accordance with a prescribed value of regulated DC voltage Vreg relative to ground. This is achieved by installing or coupling a voltage regulator 50 in circuit with the voltage divider 20, either in a path between the input battery voltage Vbat to the voltage divider node 21 that is applied to both the tip and ring amplifiers of the SLIC, or coupling the voltage divider 50 directly to the node 21, as shown, for example, in Figure 3 and 4 of the drawings of the present application.

Pursuant to the circuit architecture and methodology of the invention, each of the tip and ring amplifiers have their first polarity inputs coupled to the node 21, the voltage of which is controlled by the voltage regulator 50. The voltage regulator 50

establishes the voltage at the node 21, so that the voltage supplied by that node to the tip and ring amplifiers is either equal to the DC input voltage Vbat (which is the case where the DC input voltage Vbat is less than the regulated voltage Vreg), or is limited to the regulated voltage (which is the case where the input voltage Vbat exceeds the regulated DC voltage Vreg). The currents supplied to the second polarity inputs (12T/12R) of the tip and ring amplifiers is determined by the current flowing through the voltage divider, as regulated by the prescribed value of regulated voltage Vreg.

In more particularly defining the invention in Claims 21-32, applicants have characterized the connection of the voltage regulator to the voltage divider, and the voltage-dividing node 21 to the first polarity inputs of the tip and ring amplifiers. This feature had been previously characterized in dependent Claim 17 and dependent Claim 19.

In the Final Rejection of October 19, 2005, the limitations of Claims 17 and 19 have been attributed to a "node" between resistor 113 and transistor 112 of the circuit diagram of Figure 11 of Takato et al. This circuit is described in column 10, lines 16-68, and column 11, lines 1-29 of the cited patent. As described therein, the current I_B, which flows into one of the A or B side circuits in accordance with the operation of the current switching means 103, is determined by the power source voltage V_{BB} and the value of the resistor 113, as described particularly in column 10, lines 47-49 of Takato et al. The patentees indicate that the fluctuation of the voltage V_{BB} becomes the fluctuation of the current I_B..., so that the bias voltage can automatically follow fluctuations in the power source voltage V_{BB}.

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In the explanation of the rejections of Claims 17 and 19 on pages 4 and 5 of the final rejection, it has been alleged that Figure 11 of Takato et al clearly depicts a voltage dividing node (the node between resistor 113 and transistor 112) being coupled to the current supplies 101 and 102. Applicants respectfully submit that this statement is inaccurate.

In the first place, Takato et al only show one current supply, namely the reference current generating means 102. This reference current generator supplies an output current I_B, that is switchably delivered to either the current mirror circuit 101 or to the current mirror circuit 101', based upon the operation of the current switching means 103. Secondly, the "node" between the resistor 113 and the transistor 112 is not coupled to anything outside of the circuit 102. It is simply a connection between the emitter of transistor 112 and the upper end of resistor 113, the other end of which is referenced to the supply voltage V_{BB}. The characterization of what is disclosed in Figure 11 of Takato et al in the rejections of Claims 17 and 19 is inaccurate and not supported by the evidence (Takato et al) upon which it is based.

In contradistinction thereto, the voltage dividing node 21 of the voltage divider 20 of the present application, such as that shown in Figure 4 of the drawings of the present application, is provided with voltage regulation by means of the voltage regulator 50, so as to control the voltage supplied to the common nodes 11T and 11R, and the currents generated by current sources of 41T and 41R, in the manner called for in each of the replacement Claims 21, 25 and 29 which, as pointed out above, more particularly delineate both the connection of the voltage divider to the tip and ring amplifiers and the connection and functionality of the voltage regulator coupled to the voltage dividing node of the voltage divider.

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Applicants do not understand why the statements of the rejections of Claims 17 and 19 make further reference to "the rejection of Claim 1"; Claim 1 had been previously cancelled. It is respectfully submitted that the patent to Takato et al does not contain either the architecture or the functionality of the circuitry delineated in Claims 21, 25 and 29.

The secondary reference to McAndrews, 5,160,851, discloses a back-up battery system for a switching equipment load within a telephone central office. McAndrews does not address a battery feed for a tip/ring amplifier, or how one would modify a tip/ring amplifier circuit of the type disclosed by Takato et al to result in a configuration upon which applicants' claims would read. McAndrews' concern is the coupling of the appropriate number of cells of a set of rechargeable batteries, to insure that the rechargeable batteries, once they are brought into operation, will provide a voltage sufficient to maintain the load voltage at the nominal negative voltage value V_N for a preselected period. Not being related to the functionality of a battery feed for a tip/ring amplifier, McAndrews' back-up battery system is not concerned with, nor does it control, the regulation of a voltage for a voltage-dividing node of a voltage divider circuit to which the DC input voltage is applied for application to the first polarity inputs of both the tip and ring amplifiers of the SLIC. As such, it does not remedy the shortcomings of the patent to Takato et al with respect to the features of applicants' invention, as now more particularly delineated in Claims 21-32.

In view of the manner in which the claims have been more particularly defined to address the architecture and functionality of the voltage regulator-based battery feed circuit of the present invention for controlling the application of an input voltage to tip and ring amplifiers of a subscriber line

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circuit, favorable reconsideration of this application and a Notice of Allowablity of Claims 21-32 are earnestly solicited.

Should any minor informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to Deposit Account No. 01-0484 and please credit any excess fees to such deposit account.

Respectfully submitted,

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CERTIFICATE OF FACSIMILE TRANSMISSION

I HEREBY CERTIFY that the foregoing correspondence has been forwarded via facsimile number **571-273-8300** to MAIL STOP RCE, COMMISSIONER FOR PATENTS, this 16 day of February 2006.

D. Kallemeyer